Jurnal SPORTIF: Jurnal Penelitian Pembelajaran
Vol. 6 No. 1, April 2020, pp. 118-131
https://doi.org/10.29407/js_unpgri.v6i1.14138

Pentingnya pemenuhan gizi pada indeks massa tubuh dan aktivitas fisik

Significance of fulfillment of nutrition on body mass index and physical activity

Indah Prasetyawati Tri Purnama Sari[1], Erwin Setyo Kriswanto[2], Riky Dwihandaka[3], Danang Pujo Broto[4], & Abdul Mahfudin Alim[5]

[1,2,3,4,5]*Faculty of Sport Science, Universitas Negeri Yogyakarta, Jl. Colombo No.1, Karang Malang, Caturtunggal, Depok, Sleman District, Special Region of Yogyakarta, 55281, Indonesia.*

Received: 21 January 2020; Revised: 28 March 2020; Accepted: 8 April 2020

Abstrak

Pemenuhan gizi yang kurang sesuai akan berdampak pada indeks massa tubuh (IMT) dan aktivitas fisik pada seseorang. Penelitian ini bertujuan untuk mengetahui hubungan pemenuhan gizi dengan IMT dan aktivitas fisik. Penelitian ini merupakan penelitian korelasional, dengan metode survey. Teknik pengumpulan data menggunakan kuisioner dan pengukuran berat badan dan tinggi badan. Populasi dalam penelitian ini adalah siswa Sekolah Dasar di Kabupaten Sleman Daerah Istimewa Yogyakarta dengan teknik pengambilan sampel menggunakan *purposive random sampling*. Total sampel sebanyak 236 siswa. Instrumen penelitian menggunakan *food recalls* 24 jam untuk mengetahui pemenuhan gizi dengan timbangan tanita, *microtoise* untuk mengukur IMT, dan Kuisioner GPAQ (*Global Physical Activity Questionnaire*) untuk mengetahui aktivitas fisik. Teknik analisis dengan analisis korelasi *Pearson*. Hasil analisis data pemenuhan gizi dengan IMT diperoleh perhitungan sinifikansi 0.00 < 0.05, berarti terdapat hubungan antara pemenuhan gizi dengan IMT. Selanjutnya hasil analisis data pemenuhan gizi dengan aktivitas fisik diperoleh perhitungan signifikansi 0,00 < 0.05, berarti terdapat hubungan antara pemenuhan gizi dengan aktivitas fisik. Berdasarkan hasil penelitian dapat disimpulkan bahwa ada hubungan yang signifikan antara pemenuhan gizi dengan IMT serta ada hubungan yang signifikan antara pemenuhan gizi dengan aktifitas fisik. Kesimpulan dari hasil penelitian menunjukkan bahwa terdapat hubungan yang signifikan antara pemenuhan gizi dengan IMT dan aktivitas fisik.

Kata kunci: pemenuhan gizi, indeks massa tubuh, aktivitas fisik.

Abstract

Malnutrition troubles body mass index and physical activity. This study aims to analyze the relation of fulfillment of Nutrition on body mass index and physical activity. This research is a correlational study supported by survey methods. Data collection technique employs questionnaires and measurements of body weight and height. The population in this study is elementary school students in Sleman Yogyakarta and a sampling technique employs purposive random sampling. The total samples are 236 students. The research instrument uses 24-hour food recalls to determine fulfillment of Nutrition; tanita weight scales, microtoise to measure body mass index, and GPAQ (Global Physical Activity Questionnaire) to

Correspondence author: Indah Prasetyawati Tri Purnama Sari, Universitas Negeri Yogyakarta, Indonesia. Email: *indah_prasty@uny.ac.id*

determine physical activity. Furthermore, analysis technique employs Pearson correlation analysis. The data analysis results of fulfillment of Nutrition and body mass index obtain syndication calculations 0.00 <0.05, meaning there is a relationship between the fulfillment of nutrition and body mass index. Additionally, the data analysis results of fulfillment of Nutrition and physical activity obtain significance calculation 0.00 <0.05, which means there is a relation between fulfillment of Nutrition and physical activity. Briefly, there is significant relation between the fulfillment of nutrition and body mass index as well as between the fulfillment of nutrition and physical activity. In another words, the study shows positive link between fulfillment of Nutrition with body mass index and physical activity.

Keywords: body mass index, physical activity, fulfillment of nutrition.

INTRODUCTION

Childhood physical inactivity tends to develop a negative impact on children. Elementary school students' inactivity is also affected by rapid development of technology. Eating habit is one of the examples; fast food becomes consumption patterns though such kind of food does not provide complete nutritional substances. National Institute of Health Research and Development, Ministry of Health Indonesia (2013) states that Indonesian people who consume less vegetables and fruits are 93.6%. The fact is similar to the reality in Canada. Children and adolescents tend to dislike fruit and vegetables (Fung C, Mclsaac J., et al., 2013).

National Institute of Health Research and Development, Ministry of Health of Indonesia (2013), states that 48.3% of Indonesian people over the age of 10 years are doing less physical activity. In women group, 54.4% of them are lacking of physical activity. Such percentage is higher than men who are 41.4% of them are doing less physical activity. In addition, these results also mention the lacking of physical activity in urban of 57.6% which is higher compared to rural areas of 43.3%. Data of Basic Health Research (National Institute of Health Research and Development, Ministry of Health of Indonesia, 2013) shows that in Indonesian people over the age of 10 years belong to the category of physical inactivity reaches 26.1%. The five provinces whose percentage exceeds this number are 1) DKI Jakarta (44.2%), 2) Papua (38.9%), 3) West Papua (37.8%), 4) Southeast Sulawesi and Aceh (37.2%) %), and Special Region of Yogyakarta (20.8%).

https://doi.org/10.29407/js_unpgri.v6i1.14138
6 (1) 2020 | 118-131

Data of World Health Organization (WHO, 2015) shows an increase of overweight in Indonesia, with BMI ≥ 25 kg / m2 at the age of 15 years. In 2002, 9.6% of the Indonesian men were overweight. The increase in 2010 became 9.7%. Meanwhile, Indonesia women had a significant increase in obesity prevalence in 2002 of 20.3%. Such obesity prevalence increases again in 2010 to 27.1%. The high percentage of less physical activities of Indonesian establishes sedentary behavior (lack of activity) that possibly leads to obesity and overweight. In 2013, these became national problem. The percentage of such problems in children at the age group of 5-12 years is still relatively high of 18.8%, consisting of obesity of 8.8%, and overweight of 10.8%. Even 15 provinces in Indonesia have obesity prevalence above the national percentage (National Institute of Health Research and Development, Ministry of Health of Indonesia, 2013).

The above research results are affected by today children habit who likes to carry out their activities while sitting rather than other energetic activities. Sit is a new smoking, means a phenomenon of sitting for a long time is like smoking which harms body metabolism. Even for adults who obey physical activity guidelines, sitting for long time still dangers their metabolic health. Watching television shows and sitting too long in the car increase the risk of death (Owen, N., Healy, G. N., Matthews, C. E., & Dunstan, D. W., 2010). Research of Cardon, De Craemer, De Bourdeaudhuij, & Verloigne, (2014) state that the prevalence rate of children who are overweight and obese are still high. There is a need for effective interventions that focus on more physical activity with less sitting for children. A socio-ecological approach, school and preschool involvement as well as parents' guidance are important for interventions in promoting children to have more physical activity and less sitting.

Fulfillment of balanced nutrition is also carried out especially in Elementary school-age, because children do many physical activities at this period. Rapid growth at this age is significant, because they are in the

https://doi.org/10.29407/js_unpgri.v6i1.14138
6 (1) 2020 | 118-131

growth spurt period. Data on basic health research in 2013 showed that in 2013 the growth of children in the age group of 5-12 years in the Special Region of Yogyakarta was in the lowest category. Whereas the average energy demand for children in the age group of 5-12 years in Indonesia is 86.5% with the proportion consuming <70% AKE or 29.7% (Indonesian Ministry of Health, 2013).

The data above illustrates that the children's nutrition should get more attention from the inside family and the school environment. The nutritional benefits are very important for the body, especially for elementary school students who are still in the stage of growth and development. Besides, providing balanced nutrition at this age will reduce the occurrence of infectious diseases as an effort to prevent and overcome the lacking nutrition. Government policies of implementation national strategies for food consumption patterns and physical activities focus on increasing food availability and access, increasing the quality of food consumption, increasing physical activity, and increasing the degree of public health and nutrition (Ministry of Health of the Republic of Indonesia, 2011: 23).

According to the explanation above, this research assumes the relations of nutrition fulfillment with Body Mass Index and physical activity. However, the relation should be examined based on how strong the ties are. Observing the existing problems in Elementary schools in Sleman, Yogyakarta, most students carry out simple physical activity such as studying at school and their free time is commonly used to relax, play online games or play with mobile phones. This decreases the intensity of physical activity.

Based on this observation, this study aims to prove the relation of fulfillment of Nutrition with body mass index and physical activity in elementary school students in Sleman, Yogyakarta Special Region.

METHOD

This research is a correlational study employing survey methods. Nutrition fulfillment data are obtained using a food recall instrument; Body

https://doi.org/10.29407/js_unpgri.v6i1.14138
6 (1) 2020 | 118-131

Mass Index (BMI) is obtained by measuring height using microtice and measuring weight using Tanita scales and physical activity using the Global Physical Activity Questionnaire (GPAQ) (Armstrong, T., & Bull, F. 2006).

The population in this study is elementary school students in Sleman, Yogyakarta. Determination of the samples employs purposive random sampling. The criteria used in determining the samples are as follows:

a) The fifth grade of elementary school students, who are 10-12 years old,
b) The school should have 2 break times which is 15 minutes of each break,
c) Students must present in the time of data collection, and
d) The school allows researchers to collect research data

Based on these provisions, the total samples are 236 students from 8 Elementary schools.

Table 1. Samples categorized by Gender

No	Genders	Total
1	Boys	121
2	Girls	115
	Total	**236**

The steps for data retrieval are as follows:

(a) Fulfillment of nutrition is carried out by distributing it and samples are asked to fill in the Food Recalls questionnaire then all food consumed is recorded within 24 hours, for 7 days, then the is analyzed by looking at the average in each day.

(b) Body Mass Index (BMI) is obtained by measuring body weight using Tanita scale and body height using Microtice. BMI calculation uses the formula: BMI = Weight (kg) / Height^2 (m2) (Porcari, Bryant, & Comana, 2015). The obtained data based on existing categories are converted.

https://doi.org/10.29407/js_unpgri.v6i1.14138
6 (1) 2020 | 118-131

Table 2. Score Conversion of Body Mass Index

Criteria	Score Conversion
severely underweight	1
underweight	2
Normal weight	3
overweight	2
obesity	1

(c) Physical activity is obtained by distributing GPAQ questionnaire then the samples record the process for one week related to carried out physical activity. Then, the results are calculated to find the averages and measured to obtain the calories per day.

Data analysis technique employs Pearson correlation analysis using SPSS version 20.00.

RESULT AND DISCUSSION

RESULT

1. Data Description of Fulfillment of Nutrition of Elementary School Students in Sleman.

The results of the research and analysis on the nutrition fulfillment of 236 fifth grades of elementary school students in Sleman that have been carried out are as follows: a maximum score of 4149.00 calories; a minimum score of 254.20 calories; an average score of 1120.73 calories and a standard deviation of 542.63.

2. Data Description of Body Mass Index of Elementary School Students in Sleman.

The results of research and data analysis on body mass index of 236 fifth grades of elementary school students are as follows, a maximum score of 28.32; a minimum score of 12.40; an average score of 17.10 and a standard deviation of 3.16. Body mass index data of fifth grade of elementary school students in Sleman is in the following table:

https://doi.org/10.29407/js_unpgri.v6i1.14138
6 (1) 2020 | 118-131

Table 3. Body Mass Index

Criteria	Total	Percentage (%)
Severely underweight	2	1
Underweight	17	7
Normal weight	170	72
Overweight	36	15
Obesity	11	5
Total	**236**	**100**

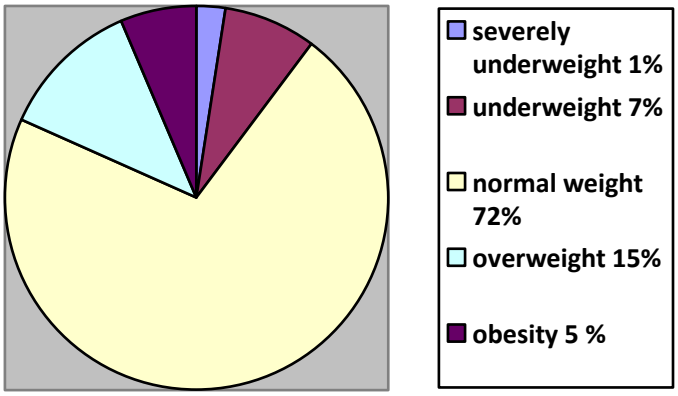

Figure 1. Students' Body Mass Index

Based on the results of the research and analysis of these data, it can be concluded that the nutritional status of elementary school students in Sleman are as follows; those in "severely underweight " are 2 students (1%), those in the "underweight" are 17 students (7%), those in the "normal weight" are 170 students (72%), those in the "overweight" are 36 students (15%) and in the " obesity" are 11 students (5%).

3. Data Description of Physical Activity of Elementary School Students in Sleman

The results of physical activity research and data analysis that has been carried out from 236 students are as follows: a maximum score is 4.72 and a minimum score is 1.70; an average score is 3.02 and a standard deviation is 0.67. Data on physical activity of elementary school students in Sleman can be seen in the following table:

https://doi.org/10.29407/js_unpgri.v6i1.14138
6 (1) 2020 | 118-131

ISSN : 2477-3379 (Online)
ISSN : 2548-7833 (Print)

Table 4. Data on Students' Physical Activity

No	Criteria	Total	Percentage
1	low	73	31
2	moderate	118	50
3	high	42	18
4	extremely high	3	1
		236	100

Physical activity of the fifth grade elementary school students in Sleman can be seen in the following chart.

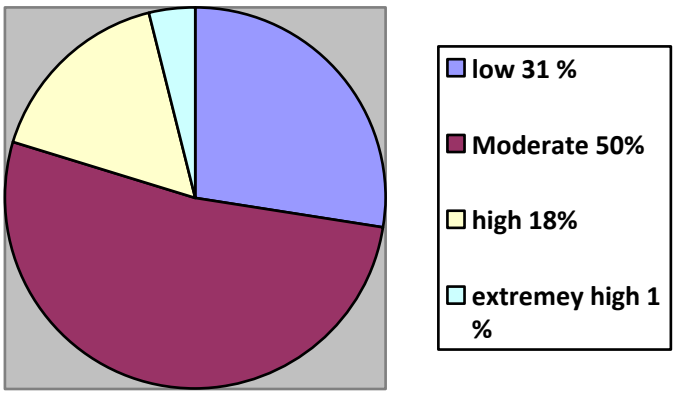

Figure 2. Physical Activity of Students

Based on the physical activities diagram above, students who are in the low category are 73 students (31%), in the moderate category are 118 students (50%), in the high category are 42 students (18%), and extremely high category are 3 students (1%).

Hypothesis testing

1. Correlation of Fulfillment of Nutrition and Body Mass Index in elementary School Students in Sleman

In the test, if the value of sig (2-tailed) <0.05, it means there is a significant correlation, if the value of sig (2-tailed)> 0.05, then it means there is no significant correlation. The results of data analysis can be seen in the table 5.

https://doi.org/10.29407/js_unpgri.v6i1.14138
6 (1) 2020 | 118-131

Table 5. Correlation Test of Fulfillment of Nutrition and Body Mass Index (BMI)

			BMI
Nutritional_fulfillment	Pearson Correlation	1	,533**
	Sig. (2-tailed)		,000
	Sum of Squares and Cross-products	69194081,093	47073,860
	Covariance	294442,898	200,314
	N	236	236

**. Correlation is significant at the 0.01 level (2-tailed).

Based on the correlation test results in table 4, the sig values are 0.00 <0.05 meaning a significant relation between fulfillment of nutrition and the body mass index of elementary school students in Sleman, with a correlation coefficient of 0.533. This indicates a relation in the medium category.

2. The Correlation of Fulfillment of Nutrition and Physical Activities in Elementary School Students in Sleman

In the test, if the value of sig (2-tailed) <0.05, then it means there is a significant relation, if the value of sig (2-tailed)> 0.05, then it means there is no significant relation. The results of data analysis that have been carried out can be seen in the table 6:

Table 6. Correlation test for Fulfillment of Nutrition and physical activity

		Fulfillment of Nutrition	Physical Activities
Fulfillment of Nutrition	Pearson Correlation	1	,313**
	Sig. (2-tailed)		,000
	Covariance	294442,898	113,810
	N	236	236

**. Correlation is significant at the 0.01 level (2-tailed).

Based on the results of the correlation test in table 5, the sig values are 0.00 <0.05 which means there is a significant relation between the fulfillment of nutrition and physical activity of elementary school students in Sleman, with a correlation coefficient of 0.313. This indicates a relation in the low category.

https://doi.org/10.29407/js_unpgri.v6i1.14138
6 (1) 2020 | 118-131

DISCUSSION

1. Relevance of Fulfillment of Nutrition and Body Mass Index

The results show the correlation between fulfillment of nutrition and body mass index of elementary school students, which is in the moderate category. Fulfillment of nutrition has an impact on body mass index. By consuming balanced and nutritious food, students will have a normal body mass index. In contrast, under-consumption or overconsumption also affects body mass index negatively. Malnutrition leads students into underweight category, while excess-nutrition causes students into overweight category. As for now, obesity is regarded as condition affected by calorie intake in relation to consumption (Kaur, Bains, & Kaur, 2012). Moreover, nutrition fulfillment is also affected by gender; boys and girls have different nutritional adequacy rates (Spencer, R. A., et al., 2015: 2).

Fulfillment of nutrition is commonly known as energy intake. Ideally maintaining energy balance should be done every day; that is, by paying attention to daily energy expenditure that matches energy intake (Bompa & Buzzichelli, 2015). Irregular eating patterns will affect the body mass index, because the intake is out of balance with that issued. Diet, obesity, and physical activity all have important impacts on health (Wollaston et al., 2015). The incorrect measurement of diet and food consumption can also be considered a special limitation in relation to body mass index (Monteiro, Silva, Forte, & Carvalho, 2019).

The contribution of nutritional intake on body mass index is not solely calculated in this present, but an accumulation of food intake since baby. Nutrition modification shows that nutritional intake since the baby is in the womb and since young age will have an optimal influence on learning ability, emotional development, height, and overweight (Black, et al., 2013).

Body mass index is closely related to body weight and height. In its simplest definition, weight maintenance consists of three main factors namely metabolic nutrition utilization, dietary habits, and physical activity (Porcari et al., 2015). Physical growth is closely related to cognitive

https://doi.org/10.29407/js_unpgri.v6i1.14138
6 (1) 2020 | 118-131

development, socio-emotional, and various risk factors and its prevention (Black, et al., 2017). Fulfillment of balanced nutrition in students especially on the growth and development stage has a positive impact on their body. Excessive nutrition will inhibit students' activities in daily life. The active physical motions affect body mass index so that it will lower the risk of over-nutrition (Dayinta, Ermona, & Wirjatmadi, 2018). Fulfillment of nutrition has a role in improving body mass index. Therefore, fulfillment of balanced nutrition with special attention of proper dietary patterns will help improve body mass index.

2. Relevance of Fulfillment of Nutrition and Physical Activity

The relation of fulfillment of nutrition and physical activity is in the low category. The research conducted by Kaur et al., (2012) shows that dietary pattern and physical activity have a strong relation with anthropometric parameters and body composition of women increases with age. While others state that a person, who has ideal body weight, is not always physically fit. To determine the physical fitness of a person, the observation should not only on physical appearance but also on physical fitness measurement test (Sudibjo, Prijo., Prasetyo, Yudik., Rismayanthi, 2019).

Body composition is not only formed by exercise, but also other factors such as food intake (Ahmad, Amir, & Rosli, 2015). Energy utilization on physical activity is important for achieving energy balance to help maintaining weight. Fulfillment of balanced nutrition tends to increase physical fitness, because such fulfillment builds adequate energy within body so that any activity can be carried out well (Permatasari, Adi, & Dewi, 2018).

Nutritional intake does not directly increase physical activity. The considerable health benefits of physical activity depend not only on body weight (Wollaston et al., 2015). This means that when nutritional intake is achieved, physical activity does not necessarily increase because physical activity is not only influenced by fulfillment of nutrition. Excess

https://doi.org/10.29407/js_unpgri.v6i1.14138
6 (1) 2020 | 118-131

food consumption causes high energy intake as a cause of low physical activity (Sepriadi, 2017).

Research conducted by Hidayat & Suroto (2017) mentions health risks deliver more serious threat to people who have normal nutritional intake but less fit than those who are overweight or slightly obese but are physically active.

Physical activity is influenced not only by the fulfillment of nutrition, but also other factors such as diet, age, motivation, economic status and the environment. In dietary pattern, the latest dietary guidelines recommend, other than consuming fruits and vegetables, ones should do things such as reducing the consumption of saturated fat and sodium, increasing the intake of wheat and enhancing physical activity (Pinto, Toro, & Vicéns, 2014). Body fat increase related to age is primarily attributed to decline in physical activity and basal metabolic rate as well as dietary intake (Kaur et al., 2012).

“if physical activity were a drug, then the range of its benefits on mental wellbeing, mental illness, heart disease, obesity, diabetes, and osteoporosis (Wollaston et al., 2015). To support daily physical activity, the intake of nutrition should be adjusted to energy sufficiency so that the need of students’ energy will be fulfilled. Determination of the amount of calories or energy is based on physical activity; the higher physical activity of a person, the more calories needed.

CONCLUSION AND RECOMMENDATION

Conclusion

Based on the results of study in elementary school students in Sleman, Yogyakarta, significant relation between fulfillment of nutrition and Body Mass Index (BMI) is in the moderate category and significant relation between fulfillment of nutrition and physical activity is in the low category.

Recommendation

The following is recommendation for future research;

1. Food recall recording and physical activity can be developed not only using questionnaires but also direct observation or interview.

https://doi.org/10.29407/js_unpgri.v6i1.14138
6 (1) 2020 | 118-131

2. Research variables can be developed, such as by adding variables of physical fitness level, heart recovery rate, or body fat percentage.

REFERENCES

Armstrong, T., & Bull, F. (2006). Development of the world health organization global physical activity questionnaire (GPAQ). *Journal of Public Health*, *14*(2), 66-70.

Ahmad, M. F., Amir, M., & Rosli, A. (2015). Effects of Aerobic Dance on Cardiovascular Level and Body Weight Among Women. *International Scholary and Scientific Reserch & Inovation.*, *9*(12), 874–882.

Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan RI. (2013). *Riset kesehatan dasar (RISKESDAS) 2013*. Jakarta.

Black, M. M., Walker, S. P., Fernald, L. C., Andersen, C. T., DiGirolamo, A. M., Lu, C., & Devercelli, A. E. (2017). Early Childhood Development Coming of Age: Science Through The Life Course. *The Lancet*, *389*(10064), 77-90.

Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., De Onis, M., & Uauy, R. (2013). Maternal and Child Undernutrition and Overweight In Low-Income And Middle-Income Countries. *The lancet*, *382*(9890), 427-451.

Bompa, T., & Buzzichelli, C. (2015). *Periodization Training for Sports-3rd Edition*. Retrieved from https://books.google.com/books?id=Zb7GoAEACAAJ&pgis=1

Cardon G, De Craemer, M., De Bourdeaudhuij, I., & Verloigne, M. (2014). More Physical Activity And Less Sitting In Children: Why And How?. *Science & Sports*. 29: S3–5

Dayinta, N., Ermona, N., & Wirjatmadi, B. (2018). Hubungan Aktivitas Fisik Dan Asupan Gizi Dengan Status Gizi Lebih Pada Anak Usia Sekolah Dasar Di Sdn Ketabang 1 Kota Surabaya Tahun 2017. *Amerta Nutrition*, *2*(1), 97–105. https://doi.org/10.20473/amnt.v2.i1.2018.97-105

Fung C, Mclsaac J-LD, Kuhle S, Kirk SFL, Veugelers PJ. (2013). *The Impact of a Population-Level School Food And Nutrition Policy On Dietery Intake And Body Weights Of Canadian Children*. Prev Med.

Hidayat, A., & Suroto. (2017). Hubungan Antara Status Gizi dan Aktivitas Fisik dengan Tingkat Kebugaran Jasmani Siswa. *Jurnal Pendidikan Olahraga Dan Kesehatan*, *4*(2), 516–521.

Kaur, G., Bains, K., & Kaur, H. (2012). Body Composition, Dietary Intake and Physical Activity Level of Sedentary Adult Indian Women. *Food and Nutrition Sciences*, *03*(11), 1577–1585. https://doi.org/10.4236/fns.2012.311206

https://doi.org/10.29407/js_unpgri.v6i1.14138
6 (1) 2020 | 118-131

Monteiro, A. M., Silva, P., Forte, P., & Carvalho, J. (2019). The Effects Of Daily Physical Activity On Functional Fitness, Isokinetic Strength And Body Composition In Elderly Community-Dwelling Women. *Journal of Human Sport and Exercise*, *14*(2), 385–398. https://doi.org/10.14198/jhse.2019.142.11

Owen, N., Healy, G. N., Matthews, C. E., & Dunstan, D. W. (2010). Too Much Sitting: The Population-Health Science of Sedentary Behavior. *Exercise and sport sciences reviews*, *38*(3), 105.

Permatasari, F. D., Adi, A. C., & Dewi, R. C. (2018). Correlation Between Nutrition Status, Physical Activity and Fitness Level among Basketball Players in Student's Basketball Club. *Amerta Nutrition*, 332–339. https://doi.org/10.20473/amnt.v2.i4.2018.332-339

Pinto, E., Toro, B., & Vicéns, L. (2014). Nutrition and Physical Activity Interventions for Childhood Obesity: Lessons Learned. *Ecology of Food and Nutrition*, *53*(5), 503–513. https://doi.org/10.1080/03670244.2013.873422

Porcari, J. P., Bryant, C. X., & Comana, F. (2015). *Exercise Physiology (Foundations of Exercise Science) 1st Edition*. Philadelphia: Quincy McDonald.

Sepriadi, S. (2017). Kontribusi status gizi dan kemampuan motorik terhadap kesegaran jasmani siswa sekolah dasar. *Jurnal Keolahragaan*, *5*(2), 194. https://doi.org/10.21831/jk.v5i2.15147.

Spencer, R. A., Rehman, L., & Kirk, S. F. (2015). Understanding gender norms, nutrition, and physical activity in adolescent girls: a scoping review. *International Journal of Behavioral Nutrition and Physical Activity*, *12*(1), 6.

Sudibjo, P., Prasetyo, Y., & Rismayanthi, C. (2019). Tinggi Badan , Berat Badan , Serta Indeks Masa Tubuh (Imt) Bagi Mahasiswa Program Studi Ilmu Keolahragaan FIK UNY Tahun Akademik 2018. *Medikora*, *XVIII*(2), 108–120.

Wollaston, S., Conservative, M. P., Cooper, R., Labour, M. P., Lancashire, W., George, A., … West, B. N. (2015). *Impact Of Physical Activity And Diet On Health Sixth Report of Session 2014-15 Report, together with formal minutes relating to the report The Health Committee*. (March). Retrieved from www.parliament.uk.

World Health Organization. (2015). *Physical Activity Factsheet*. http://www.who.int/mediacentre /factsheets/fs385/en/.